

CLAIMS

1. Rate sensing apparatus comprising:
two or more object detectors spaced apart along a direction of movement of an object, each of said object detectors including at least one rate drive plate and at least one
5 rate pickup plate, wherein an end of an object passing over each of said object detectors produces a change in capacitance between respective rate drive plates and rate pickup plates.
2. Rate sensing apparatus as defined in claim 1, wherein the rate drive plate and the
10 rate pickup plate of each of said object detectors are disposed generally laterally with respect to the direction of movement of the object.
3. Rate sensing apparatus as defined in claim 1, wherein the rate pickup plates of
said sets of rate sensing plates are commonly connected.
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4. Rate sensing apparatus as defined in claim 1, wherein each of said object
detectors includes first and second rate pickup plates disposed on opposite sides of the
rate drive plate to form a differential rate sensor.
- 20 5. Rate sensing apparatus as defined in claim 4, wherein the rate drive plates of said
object detectors are commonly connected.
6. Rate sensing apparatus as defined in claim 1, wherein the rate drive plates and the
rate pickup plates of said object detectors are dimensioned and spaced for detecting the
25 speed of a moving finger.
7. Rate sensing apparatus as defined in claim 6, wherein the rate drive plates and the
rate pickup plates of said object detectors are curved to substantially match the curve of a
typical finger end.

8. Rate sensing apparatus as defined in claim 6, further comprising a substrate, wherein said rate drive plates and said rate pickup plates comprise conductive traces on said substrate.
- 5 9. Rate sensing apparatus as defined in claim 6, further comprising a flexible substrate, wherein said rate drive plates and said rate pickup plates comprise conductive traces on said flexible substrate.
- 10 10. Rate sensing apparatus as defined in claim 8, wherein said substrate comprises a printed circuit board.
11. Rate sensing apparatus as defined in claim 1, further comprising:
an excitation circuit for energizing the rate drive plates of said object detectors with drive signals, and
15 a detection circuit for detecting the drive signals capacitively coupled from the rate drive plate to the rate pickup plate of each of said object detectors to provide rate signals.
12. Rate sensing apparatus as defined in claim 11, wherein said drive signals
20 comprise signal bursts.
13. Rate sensing apparatus as defined in claim 12, wherein said signal bursts comprise bursts of a clock signal.
- 25 14. Rate sensing apparatus as defined in claim 12, wherein said detection circuit comprises a synchronous detector.
15. Rate sensing apparatus as defined in claim 11, further comprising a processing
circuit for determining a time delay between said rate signals from said object detectors,
30 wherein said time delay between said rate signals is representative of a speed of the object.

16. Rate sensing apparatus as defined in claim 1, wherein the rate drive plate and the rate pickup plate of each of said object detectors are substantially coplanar.